

PATENT CLAIMS

1. A device (20) for revealing security elements that are present in an object (8) and that have at least one photoluminescent segment which is characterized by linearly polarized absorption, characterized in that at least one UV light source, in particular preferably in the form of a UV diode (18), and at least one polarization filter (4, 30) are arranged in such a way that the light from the light source (18) is linearly polarized (12) by the polarization filter (4), strikes the object (8) and, respectively, the photoluminescent segments present therein in a dark chamber (17), and photoluminescent light (16) from the segment in the visible range can be observed through an observation opening (10).
2. The device (20) as claimed in claim 1, characterized in that the at least one UV diode (18) is a diode which emits light in the UV range from 180 to 500 nanometers, preferably from 300 to 400 nanometers, in particular in the range from 350 to 380 nanometers, and in that the UV light source or UV diode (18) preferably provides an optical output in the range from 0.5 to 20 mW, in particular preferably from 1 to 5 mW, given a current of 15 to 20 mA and room temperature.
3. The device (20) as claimed in one of the preceding claims, characterized in that the device (20) can be handled and is constructed in the form of a hand-held instrument such as, for example, in the form of a small pen, it being possible, for example, for the object (8) to be illuminated with one end with the aid of a UV light beam oriented

substantially parallel to the axis (19) and to be observed through an observation opening (10).

4. The device (20) as claimed in one of the preceding
5 claims, characterized in that the observation can
take place through a filter which substantially
does not permit light in the wavelength range of
the UV light source or UV diode (18) to pass,
while light in the wavelength range of the visible
10 photoluminescent light (16) from the segment can
pass substantially unimpeded.
5. The device (20) as claimed in one of the preceding
claims, characterized in that the polarization
15 filter (4) for observation can be rotated about an
axis perpendicular to the plane of the
polarization filter (4).
6. The device (20) as claimed in claim 5,
20 characterized in that the rotation of the
polarization filter (4) can be provided via
appropriate means (7) directly by hand or else
with the aid of a transmission mechanism, and in
that, in particular, the rotation of the filter
25 (4) through at least 180 degrees is preferably
possible.
7. The device (20) as claimed in claim 5,
characterized in that the polarization filter (4)
30 can be rotated with the aid of a motor, and in
that in this case the polarization filter (4) can
be rotated with a rotation frequency in the range
from 0.2 to 5 Hz, in particular preferably with a
rotation frequency from 0.5 to 2 Hz.
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8. The device (20) as claimed in one of the preceding
claims, characterized in that the device is
configured in the form of a pen which has a

cylindrical housing to accommodate at least one battery and a diode (18) and a lower cylindrical housing part (2), the lower housing part (2) forming a dark chamber (17) with an observation opening (10), with which the object (8) to be observed can be covered, the instrument (20) in particular preferably having a length of less than 10 centimeters and, at its thickest point, a diameter of less than 2.5 cm.

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9. The device (20) as claimed in claim 8, characterized in that the observation opening (10) in the lower housing part (2) is formed in the form of a segment cutout extending from the lower edge (11) of the lower housing part (2) with an opening angle in the range from 90 to 150 degrees with a height of less than 1.5 cm.

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10. The device (20) as claimed in one of claims 1 to 4, characterized in that 2 groups of at least one UV light source or UV diode (18) in each case, preferably of 2 UV diodes (18) in each case, are arranged, and in that these 2 groups irradiate the object (8) in a predefined, alternating manner, the first group (18a) throwing a cone of light (12) with a first polarization direction onto the object (8), and the second group (18b) throwing a cone of light (12) with a second polarization direction onto the object (8), and the first polarization direction being aligned substantially perpendicular to the second polarization direction.

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11. The device (20) as claimed in claim 10, characterized in that the UV light sources or UV diodes (18) are switched on and off alternately in groups, the change between the two groups being carried out at a frequency of 0.2 to 5 Hz, in

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particular preferably at a frequency of 0.5 to 2 Hz.

- 5 12. The device (20) as claimed in claim 10, characterized in that the UV light sources or UV diodes (18) of the 2 groups are activated with a substantially sinusoidal intensity profile, the phase shift between the 2 groups being substantially 90 degrees.
- 10 13. The device (20) as claimed in one of claims 10 to 12, characterized in that there are two groups of respectively two UV light sources or UV diodes (18), in each case UV light sources or UV diodes (18) belonging to one group (18a; 18b) being arranged opposite each other in relation to the observation axis and the two groups being arranged to be displaced by 90 degrees around the observation axis.
- 20 14. The device (20) as claimed in claim 13, characterized in that a polarization filter is arranged in front of each UV light source or UV diode (18), the orientation of the polarization direction of the polarization filters of the first group (18a) being aligned substantially perpendicular to the orientation of the polarization direction of the polarization filters of the second group (18b).
- 30 15. The device (20) as claimed in claim 13, characterized in that a cylindrical polarization filter (30) is arranged between object (8) and UV light sources or UV diodes (18), the axis of the cylindrical polarization filter (30) substantially coinciding with the observation axis and the polarization direction of the UV light (12) passing through the polarization filter (30)
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likewise being arranged parallel to the observation axis.

- 5 16. The device (20) as claimed in claim 15, characterized in that the cylindrical polarization filter (30) consists of a rolled polarization film.
- 10 17. The device (20) as claimed in one of claims 10 to 16, characterized in that a holding arm (26) and an observation tube (21) are provided, the observation tube being aligned substantially at right angles to the holding arm (26).
- 15 18. The device (20) as claimed in one of the preceding claims, characterized in that the observation is carried out through a lens, in particular preferably through a magnifying glass.
- 20 19. The device (20) as claimed in one of the preceding claims, characterized in that the observation is carried out by means of electronic aids, in particular in the form of a recording device such as a camera, in particular a digital camera, if
25 appropriate in combination with a corresponding electronic visualization means such as a display.
- 30 20. The device (20) as claimed in one of the preceding claims, characterized in that the observation is carried out through a polarization filter which, in particular, preferably substantially does not permit light in the wavelength range of the UV diode (18) to pass, while light in the wavelength range of the photoluminescent light (16) from the
35 segment can pass substantially only in a manner filtered with respect to its polarization direction.

21. The device (20) as claimed in one of the preceding claims, characterized in that means for verifying further security features are provided at the same time.
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22. The device (20) as claimed in claim 21, characterized in that the means permit the verification of magnetic, electric, optical, electronic, electro-optical features, preferably
10 selected from the group comprising bar codes, magnetic strips, conductivity, electroluminescence, photoluminescence, up-conversion (anti-Stokes), infrared signatures, electronically readable texts, also including
15 infrared text (OCR text), X-ray fluorescence features.
23. A method of revealing security elements that are present in an object (8) and that have at least
20 one photoluminescent segment which is characterized by linearly polarized absorption, characterized in that light from at least one light source in the form of a UV light source or preferably a UV diode (18) is linearly polarized
25 (12) by at least one polarization filter (4), is incident on the object (8) or, respectively, on the photoluminescent segments present therein in a dark chamber (17), and photoluminescent light
30 (16) in the visible range from the segment is observed through an observation opening (10), the method being carried out in particular with the aid of a device (20) as claimed in one of claims 1 to 22.